

Date: Tuesday, 08/04/2008 4:57:21 PM
 User: Julie Lecocq

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services		Drawing Name	: 412 X-TUBE INST,LOW NARROW AFT		
Job Number	: 38488			Part Number	: D412664205	
Estimate Number	: 12817			Drawing Number	: D412-664 -245 REV C	
P.O. Number	:			Project Number	: N/A	
This Issue	: 08/04/2008		S.O. No. :	Drawing Revision	: C	
Prsht Rev.	: NC			Material	:	
First Issue	: / /		Type :	LANDING GEAR	Due Date	: 30/05/2008 Qty: 1 Um: Each
Previous Run	: 37023					
Written By	:					
Checked & Approved By	: JD 08 4.09					
Comment	: Est Rev:A New Issue 07-04-05 JLM					

Additional Product

Job Number:



SCRAP

Seq. #:	Machine Or Operation:	Description
1.0	DC	DOCUMENT CONTROL
Comment: DOCUMENT CONTROL Photocopy bluefile and create labels as per PPP D412-664-205 CHG001		
2.0	PACKAGING 1	PACKAGING RESOURCE #1
3.0	D412664205TRN	CROSSTUBE TURNING DETAIL
Comment: PACKAGING RESOURCE #1		
4.0	BENDING	BENDING MACHINE - SKIDTUBES
Comment: BENDING MACHINE Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010		
5.0	QC6	DIMENSIONAL CHECK
Comment: DIMENSIONAL CHECK		
6.0	D36061	CUFF
Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s) CUFF Batch: _____		
<i>SCRAP</i>		

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
08/08/13	4.0	Tube is over bent. was used for a bend development	AS 08/09/09	Tube is scrap/over bent & un-even. change to bend development.			AS 08/09/09	/0808-13

NOTE: Date & initial all entries

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Job Number: 38488

Part Number: D412664205

Job Number:



Seq. #: Machine Or Operation:

Description :

7.0 CROSSTUBES CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill Rivet holes as per Dwg D412-664-245 using DT8972.

2-Drill pilot holes in tube as per Dwg D412-664-245

3-Ream hole to finish size in tube as per Dwg D412-664-245

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-245

8.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat Tube & Cuffs as per QSI 005 4.1

9.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

10.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

11.0 OUTSIDE SERV.10 OUTSIDE SERVICES -skids



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 0380r

Issue P/O: _____ LPI as per ASTM 1417

Level 2 Attach copy of NDT results to work order

SCVAP

12.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage

Ensure copy of NDT results attached to work order.

W/O:		WORK ORDER CHANGES					
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Job Number: 38488

Part Number: D412664205

Job Number:



Seq. #:	Machine Or Operation:	Description :
13.0	QC5	INSPECT WORK TO CURRENT STEP
<p>Comment: Inspect for damage & ensure results are as per Dwg D412-664-203</p>		
14.0	CROSSTUBES	CROSSTUBES RESOURCE 1
<p>Comment: LANDING GEAR RESOURCE 1</p> <p>1-Rivet Cuffs as per Dwg D412-6647-245. with Sika flex in Between tube & Cuff</p> <p>A/R SIKAFLEX -241/-291 BATCH: _____</p>		
15.0	CR3212407	CHERRY RIVET
<p>Comment: Qty.: 44.0000 Each(s)/Unit Total : 44.0000 Each(s)</p> <p>CHERRY RIVET</p> <p>Batch: _____</p>		
16.0	SPRAY PAINTING	SPRAY PAINTING
<p>Comment: SPRAY PAINTING</p> <p>1-Prime inside and outside crosstube as per QSI 005 4.2</p> <p>2-Paint outside crosstube with White Imron as per QSI 005 4.2</p>		
17.0	QC14	INSPECT SPRAY PAINT
<p>Comment: Inspect Spray Paint</p> <p>Wrap in plastic bag to protect from scratches</p>		
18.0	D31891	Chafing Shield
<p>Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)</p> <p>Chafing Shield</p> <p>Batch: _____</p>		

W/O:		WORK ORDER CHANGES					
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Customer: CU-DAR001 Dart Helicopters Services		Drawing Name: 412 X-TUBE INST,LOW NARROW AFT
Job Number: 38488		Part Number: D412664205
Job Number:		
Seq. #:	Machine Or Operation:	Description :
19.0	D3595	Rubber Cushion (per sq ft) 
Comment: Qty.: 0.0536 sf(s)/Unit Total : 0.0536 sf(s) Rubber Cushion Cut to .630" X 5.7" X 2PCS Batch: _____		
20.0	D28961	Support 
Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s) Pick: Qty Part number Description Batch 1 D2896-1 Support _____		
21.0	D2856600	Abrasion Strip 
Comment: Qty.: 0.9450 f(s)/Unit Total : 0.9450 f(s) Abrasion Strip 2 X D2856-600-1009 Batch: _____		
22.0	MS2192028	Clamp(per MIL-DTL-8783C) 
Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s) Pick: Qty Part number Description Batch 4 MS21920-28 Clamp _____		
23.0	MS2192030	clamp(per MIL-DTL-8783C) 
Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s) clamp(per MIL-DTL-8783C) batch: _____		
24.0	CROSSTUBES	CROSSTUBES RESOURCE 1 
Comment: LANDING GEAR RESOURCE 1 Assemble as per Dwg D412-664-245		
1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe		

W/O:		WORK ORDER CHANGES					
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Job Number: 38488

Part Number: D412664205

Job Number:



Seq. #: Machine Or Operation:

Description :

2-Install Chaffing Shields

3-Instal support with magnobond 6398 per dwg D412-664-245,
cure for 12hrs before packaging.

Time & date of application: _____

Batch: _____

25.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

26.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

27.0 AN640A Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Bolt

Batch: _____

28.0 AN641A Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Bolt

Batch: _____

29.0 MS21042L6 Nut



Comment: Qty.: 6.0000 Each(s)/Unit Total : 6.0000 Each(s)

Nut

Batch: _____

30.0 AN960JD616 Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total : 18.0000 Each(s)

Washer

Batch: _____

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
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Job Number: 38488

Part Number: D412664205

Job Number:



Seq. #:	Machine Or Operation:	Description :
31.0	QC4	INSPECT 100% KITS FOR COMPLETENESS
Comment: INSPECT 100% KITS FOR COMPLETENESS		
32.0	PACKAGING 1	PACKAGING RESOURCE #1
Comment: HAND FINISHING RESOURCE #1 Identify and pack for shipping as per PPP D412-664-105		
33.0	QC21	FINAL INSPECTION/W/O RELEASE
Comment: FINAL INSPECTION/W/O RELEASE		

Job Completion



mf 08-09-09

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

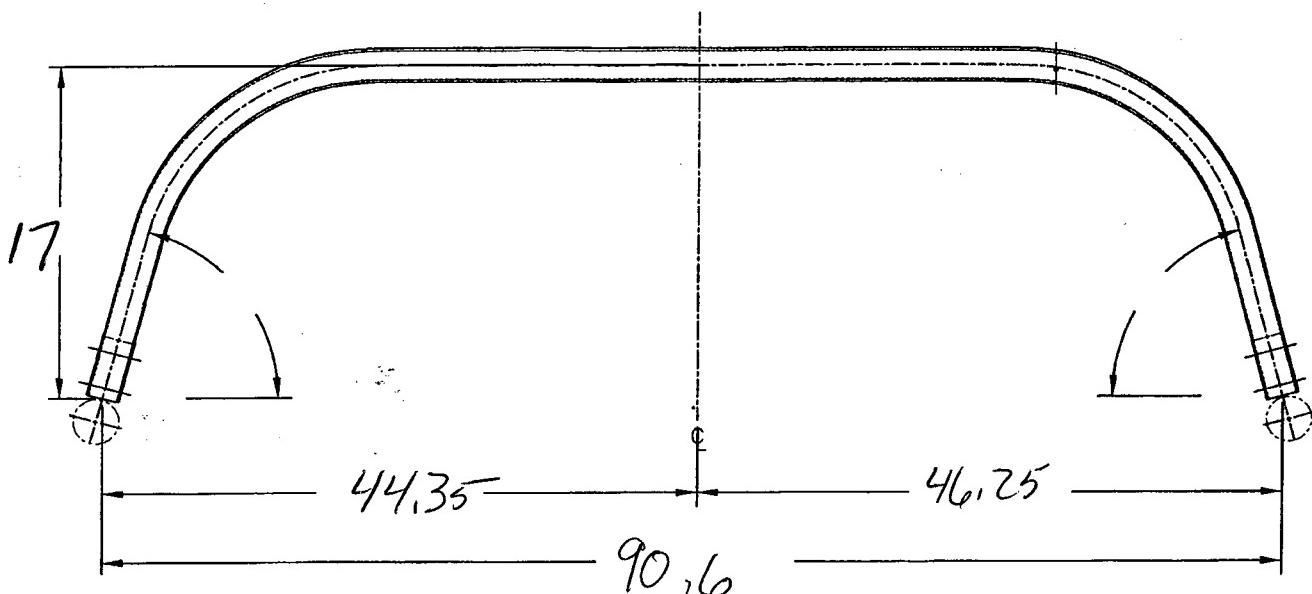
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	
Description: Crosstube Low Narrow Aft (412)	Part Number:	D412-664-205
Inspection Dwg: D412-664-245 Rev: C		Page 1 of 1

Required Dimension	Min	Max
Height	16.69	16.95
1/2 Span	46.47	46.73
Angle	49°	52°
Total Span	92.94	93.46



Comments
Tube is overbent.

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.04.27	New Issue	KJ/JM	<i>[Signature]</i>

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SUBJECT TO AMENDMENT

WITHOUT NOTICE

WORK ORDER

NO. 38488

DART

DESIGN <i>GP</i>	DRAWN BY <i>GP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[initials]</i>	APPROVED <i>[initials]</i>	DRAWING NO. D412-664-245	REV. C SHEET 1 OF 3
DATE 07.03.29		TITLE CROSSTUBE ASS'Y (412 LOW-N AFT) NTS	SCALE
A	06.12.01	NEW ISSUE	
B	07.03.01	CHG CUFF AREA, CHG RUBBER CUSHION	
C	07.03.29	CHG RIVET AND RUBBER CUSHION	

RELEASED07.04.24 *[initials]***PARTS LIST:**

Qty	Part Number	Description
X	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-570	RUBBER CUSHION
2	D3606-1	CUFF
44	CR3212-4-07	RIVET (OR M7885/3-4-07)
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6009-129
FINISHED LENGTH = 123.59 ± 0.020 (BEFORE BENDING/TRIMMING)
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART, BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF
CROSSTUBE PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE
D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY
NUT AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

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11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.

12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE
D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.

SUBJECT TO AMENDMENT
 WITHOUT NOTICE
WORK ORDER
 NO. 38488

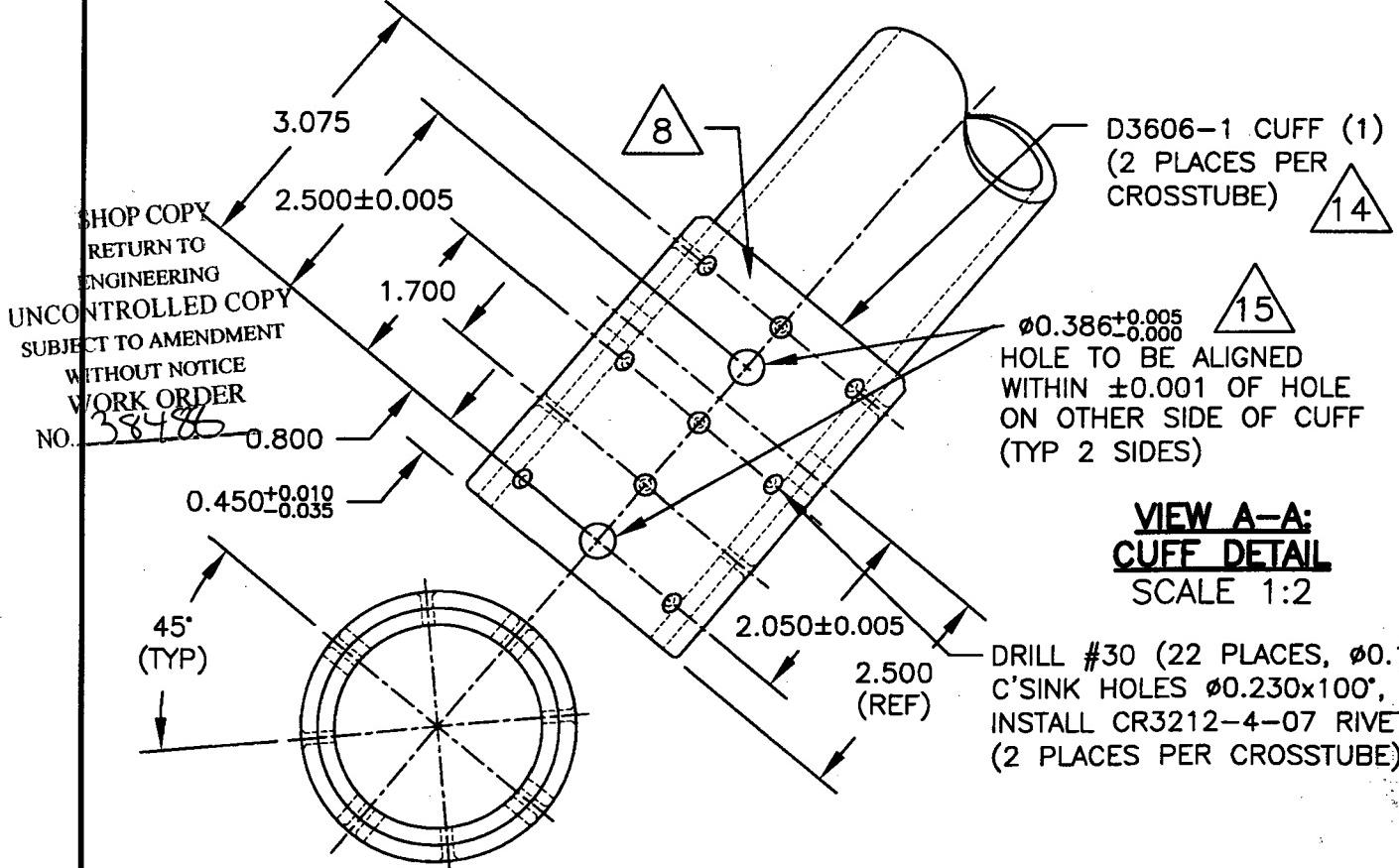
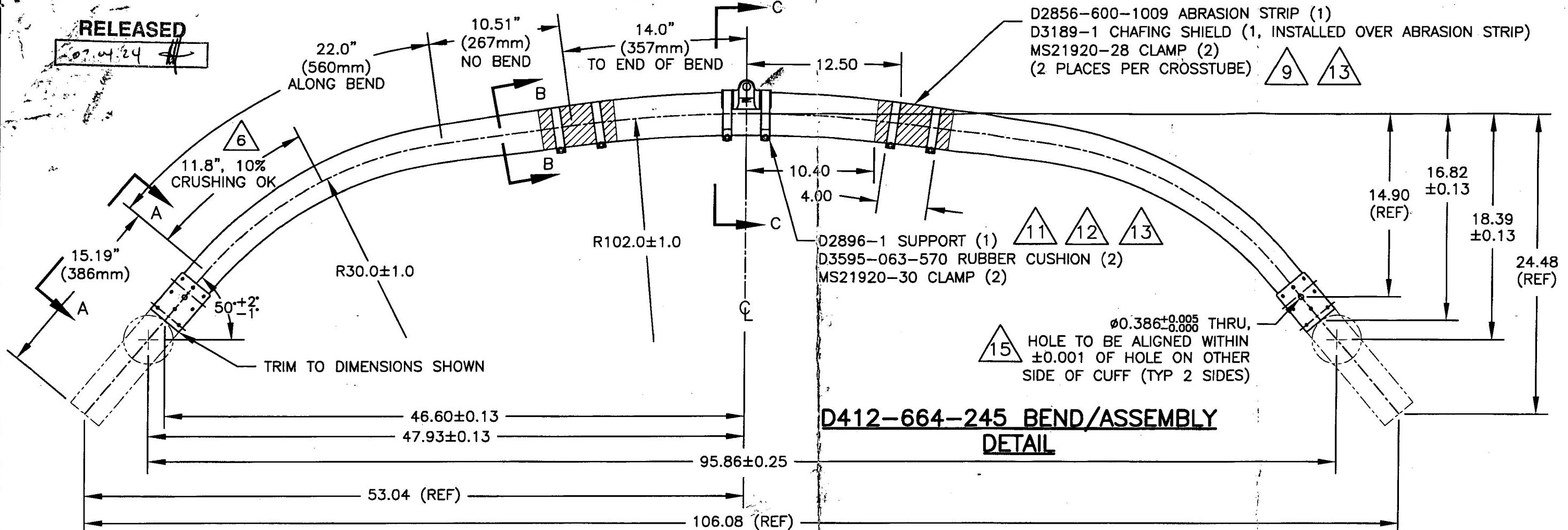
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NUT AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.

15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

RELEASED

07.04.24



D2856-600-1009 ABRASION STRIP (1)
D3189-1 CHAFING SHIELD (1, INSTALLED OVER ABRASION STRIP)
MS21920-28 CLAMP (2)
(2 PLACES PER CROSSTUBE) 9 13

D2896-1 SUPPORT (1) 11 12 13
D3595-063-570 RUBBER CUSHION (2)
MS21920-30 CLAMP (2)

15 HOLE TO BE ALIGNED WITHIN
±0.001 OF HOLE ON OTHER
SIDE OF CUFF (TYP 2 SIDES)

D412-664-245 BEND/ASSEMBLY DETAIL

SECTION B-B
SCALE 1:2

APPLY MAGNOBOND
BETWEEN D2896-1 AND
THE CROSSTUBE
11

D2896-1 SUPPORT
(REF)

MS21920-28
CLAMP (REF)

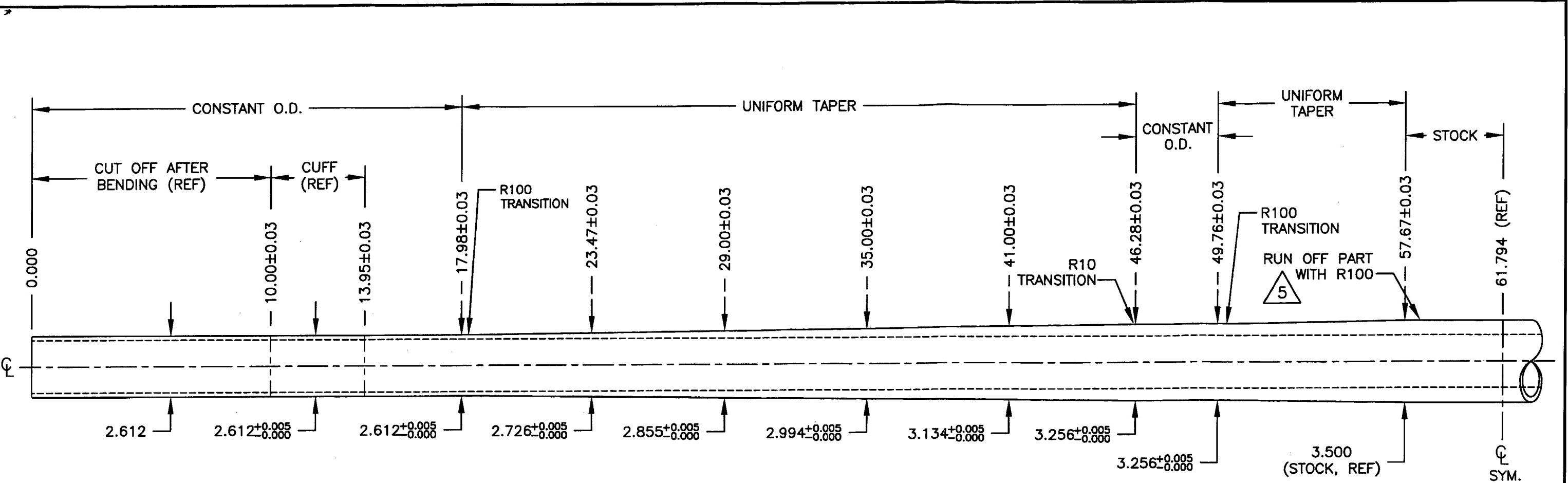
D3595-063-570
RUBBER CUSHION
(UNDER CLAMP, REF)

12 MS21920-30
CLAMP (REF)

SECTION C-C
SCALE 1:2

DART AEROSPACE LTD.
HAWKESBURY, ONTARIO, CANADA

DESIGN	DRAWN BY	DART	
gp	gp		
CHECKED	APPROVED		DRAWING NO.
			D412-664-245
DATE			TITLE
07.03.29			CROSSTUBE (412 LOW-NARROW AFT)
SCALE			



D412-664-245 MACHINING DETAIL

RELEASED

07.04.19

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NO. 394-88

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CHECKED	APPROVED				DRAWING NO. D412-664-245
		DATE	TITLE	REV. C	SCALE 1:4
		07.03.29	CROSSTUBE (412 LOW-NARROW AFT)	SHEET 3 OF 3	

